OWNER'S OPERATING MANUAL

REFLECTION

VX-1000d Projector

& DHD™ Video Controller

Widescreen Digital Light Processing™ Projector &
DHD™ Video Controller

RUNCO

THE WORLD'S FINEST HOME THEATER PRODUCTS™

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Introduction

The new VX-1000d is one of the flagships of Runco International's 3rd Generation of DLP™ front projectors. Some of the GEN 3 features include Reflectance Volume Regulation (RVR), digital video input with HDCP, 9 point Color Balance, and the latest ultra-high contrast 16:9 DMD (Digital Micro-Mirror Device) from Texas Instruments™. The Reflectance Volume Regulation (RVR) allows adjustable iris control of contrast ratio versus light output for the best imaging performance in any viewing environment. The digital video input with HDCP allows for the signal to stay digital through the entire signal path. 9-point color balance, finely adjusts color balance for better gray scale tracking than any other consumer DLP. The latest DMD produces an exceptionally high contrast ratio for high light output and better black level than film. The VX-1000d projector system also includes the DHD™ Digital Controller for converting all NTSC or PAL signals to the native resolution of the projector for viewing in various formats. For added flexibility, electronic keystone correction and vertical lens shift provide any needed leeway when installing within confined quarters.

Features

- Native 1280 x 720, Single 16:9 DMD Chip
- Servo activated Reflectance Volume Regulation (RVR)
- 16:9 Widescreen Native Resolution - Designed exclusively for 16:9 aspect screens
- Multiple aspect ratio (on 16:9 screens) - Anamorphic, Letterbox, 4:3, VirtualWide™
- Contrast Ratio 2500:1 to 3000:1 Variable (depending on RVR calibration)
- Vertical lens shift
- 3:2 pulldown detection and 2:2 pulldown detection correction
- HDTV capable (via an outboard DTV decoder); 720 (native), 1080i, 480p, 540p
- PAL compatible
- DVI-I with HDCP
- Electronic Keystone Correction

Warnings and Safety Precautions

WARNING

FCC Regulations state that any unauthorized changes or modifications to this equipment not expressly approved by the manufacturer could void the user's authority to operate this equipment.

CAUTION: TO PREVENT FIRE OR SHOCK HAZARDS, DO NOT REMOVE COVER.
DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE. ALSO DO NOT USE THIS UNIT'S POLARIZED PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLETS, UNLESS THE PRONGS CAN BE FULLY INSERTED. REFRAIN FROM OPENING THE CABINET AS THERE ARE HIGH-VOLTAGE COMPONENTS INSIDE. NO USER-SERVICEABLE PARTS EXCEPT LAMP UNIT. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING

High brightness light source. Do not stare into the beam of light, or view directly. Be especially careful that children do not stare directly into the beam of light.

WARNING

The cooling fan in this projector continues to run for about 90 seconds after the projector is turned off. During normal operation, when turning the power off always use the power (OFF) button on the projector or on the remote control. Ensure the cooling fan has stopped before disconnecting the power cord. The power outlet socket should be installed as near to the equipment as possible, and should be easily accessible.

DURING NORMAL OPERATION, NEVER TURN THE PROJECTOR OFF BY DISCONNECTING THE POWER CORD. FAILURE TO OBSERVE THIS WILL RESULT IN PREMATURE LAMP FAILURE.

PRODUCT DISPOSAL

This projector utilizes tin-lead solder, high intensity discharge lamp (HID lamp) containing a small amount of mercury. Disposal of these materials may be regulated due to environmental considerations. For disposal or recycling information, please contact your local authorities or, if you are located in the United States of America, the Electronic Industries Alliance: www.eiae.org.

INFORMATION

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the operation manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connect - ed.
- Consult the dealer or an experienced radio/TV technician for help.

Declaration of Conformity

RUNCO PROJECTOR, MODEL VX-1000d

This device complies with Part 15 of the FCC rules. Operation is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

WARNING

Some IC chips in this product include confidential and/or trade secret property belonging to Texas Instruments™. Therefore you may not copy, modify, adapt, translate, distribute, reverse engineer, reverse assemble or discompile the contents thereof.

INTELLECTUAL PROPERTY RIGHTS
----- IMPORTANT -----
READ BEFORE USING THE PRODUCT

- Digital Light Processing, DLP, Digital Micromirror Device and DMD are trademarks of Texas Instruments.
- Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries.
- PC/AT is a registered trademark of International Business Machines Corporation in the United States.
- Adobe Acrobat is a trademark of Adobe Systems Incorporated.
- Macintosh is a registered trademark of Apple Computer, Inc. in the United States and/or other countries.
- All other company or product names are trademarks or registered trademarks of their respective companies.

SAFETY TIPS

Please read and follow the safety precautions listed below to ensure the equipment is free from damage, and to ensure that no injury will occur as a result of improper use.

- Do not insert any object, especially metal or liquids, into the Projector or DHD Controller.
- Do not place any objects containing water or any other liquid on top of the Projector or DHD Controller.
- Do not place the units in direct sunlight, near heaters or in extremely dusty or humid locations.
- Do not install this system outdoors or otherwise exposed to the elements.
- Do not place heavy objects on top of the Projector or Controller.
- If the power cord is damaged or frayed in any way, electrical shock and/or fire may result. Please do not place objects on the power cord, and keep the cord away from heat-emitting devices. Should the power cord become damaged in any way, please contact your Runco Dealer for a replacement cord.
- Do not remove the cover of the Projector or DHD Controller for any reason. If any problems arise with the unit, please contact a Runco Dealer or Runco International for service. Removing the covers will void the warranty.

Limited Warranty

LIMITED WARRANTY

Congratulations on your purchase of a Runco video product and welcome to the Runco family! We believe Runco produces “The World’s Finest Home Theater Products”. With proper installation, setup and care, you should enjoy many years of unparalleled video performance. Please read this consumer protection plan carefully and retain it with your other important documents.

This is a LIMITED WARRANTY as defined by the U.S. Consumer Product Warranty and Federal Trade Commission Improvement Act.

WHAT IS COVERED UNDER THE TERMS OF THIS WARRANTY:
SERVICE LABOR: Runco will pay for service labor by an approved Runco service center when needed as a result of manufacturing defect for a period of two (2) years from the effective date of delivery to the end user.

PARTS (Not including projector lamp): Runco will provide new or rebuilt replacement parts for the parts that fail due to defects in materials or workmanship for a period of two (2) years from the effective date of the warranty. Such replacement parts are then subsequently warranted for the remaining portion (if any) of the original warranty period.

LAMP: Six months or 1000 hours (which ever comes first).

WHAT IS NOT COVERED UNDER THE TERMS OF THIS WARRANTY:
This warranty only covers failure due to defects in materials and workmanship that occur during normal use and does not cover normal maintenance. This warranty does not cover cabinets or any appearance item; any damage to laser discs; failure resulting from accident, misuse, abuse, neglect, mishandling, misapplication, faulty or improper installation or setup adjustments; improper maintenance, alteration, improper use of any input signal; damage due to lightning or power line surges, spikes and brownouts; damage that occurs during shipping or transit; or damage that is attributed to acts of God. In the case of remote control units, damage resulting from leaking, old, damaged or improper batteries is also excluded from coverage under this warranty.

CAUTION: DAMAGE RESULTING DIRECTLY OR INDIRECTLY FROM IMPROPER INSTALLATION OR SETUP IS SPECIFICALLY EXCLUDED FROM COVERAGE UNDER THIS WARRANTY. IT IS IMPERATIVE THAT INSTALLATION AND SETUP WORK BE PERFORMED ONLY BY AN AUTHORIZED RUNCO DEALER TO PROTECT YOUR RIGHTS UNDER THIS WARRANTY. THIS WILL ALSO ENSURE THAT YOU ENJOY THE FINE PERFORMANCE YOUR RUNCO PRODUCT IS CAPABLE OF PROVIDING WHEN INSTALLED AND CALIBRATED BY RUNCO AUTHORIZED PERSONNEL.

RIGHTS, LIMITS AND EXCLUSIONS:
Runco limits its obligations under any implied warranties under state laws to a period not to exceed the warranty period. There are no express warranties. Runco also excludes any obligation on its part for incidental or consequential damages related to the failure of this product to function properly. Some states do not allow limitations on how long an implied warranty lasts, and some states do not allow the exclusion or limitation of incidental or consequential damages. So the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

EFFECTIVE WARRANTY DATE:
This warranty begins on the effective date of delivery to the end user. For your convenience, keep the original bill of sale as evidence of the purchase date.

IMPORTANT: WARRANTY REGISTRATION:
Please fill out and mail your warranty registration card. It is imperative that Runco knows how to reach you promptly if we should discover a safety problem or product update for which you must be notified.

TO OBTAIN SERVICE, CONTACT YOUR RUNCO DEALER:
Repairs made under the terms of the Limited Warranty covering your Runco International video product will be performed at the location of the product, during usual working hours, providing location of product is within normal operating distance from a Runco Authorized Service Center. If, solely in Runco's judgement, location of product to be repaired is beyond normal operating distance of the closest Runco Authorized Service Center, it is the owner's responsibility to arrange for shipment of the product for repair. These arrangements must be made through the selling Runco dealer. If this is not possible, contact Runco directly for a return authorization number and shipping instructions. Runco will return product transportation prepaid in the United States, unless no product defect is discovered. In that instance, shipping costs will be the responsibility of the owner.

ADDITIONAL INFORMATION:
To locate the name and address of the nearest Runco Authorized Service location, or for additional information about this warranty, please call, write or visit our website:

CUSTOMER SERVICE DEPARTMENT
RUNCO INTERNATIONAL
2900 Faber Street
Union City, CA 94587
Ph: (510) 324-7777 / Fax: (510) 324-9300
www.runco.com

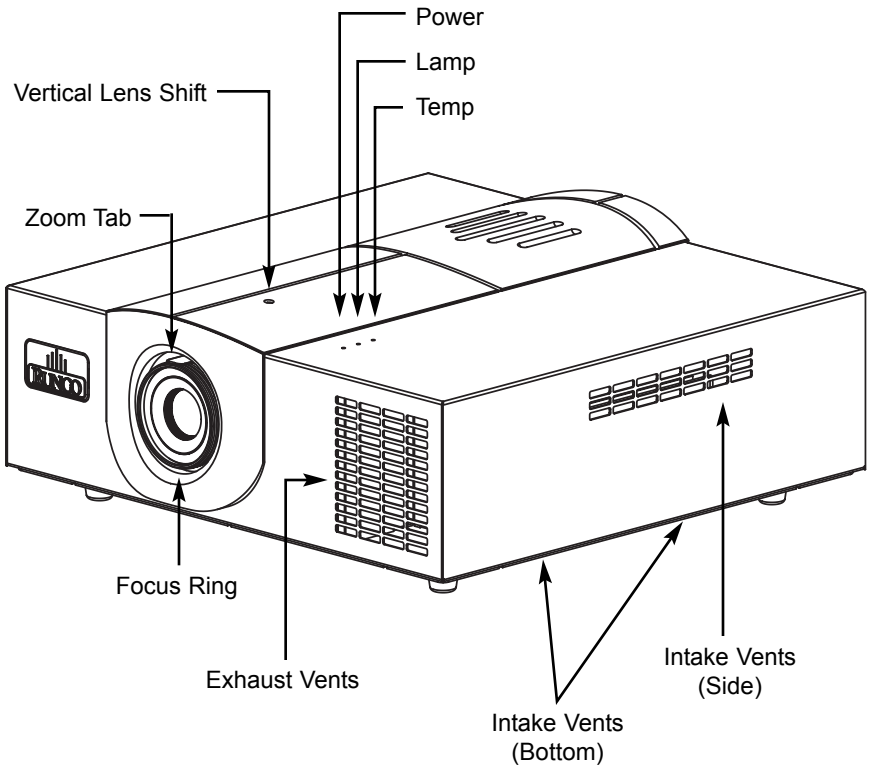
Features and Benefits

The VX-1000d system is a very unique system and has many important features, including:

- Native 1280 x 720, the latest 16:9 DMD™ Chip creates images with appropriate black levels in darkened scenes.
- DVI input with HDCP allows digital connections for a richer pixel for pixel and direct digital signal.
- 7-segment color wheel, for enhanced images
- RVR or Reflectance Volume Regulation, a GEN 3 engineering advancement. It allows the Installer to adjust light output vs. contrast ratios for proper image quality in any viewing environment.
- Full control of the Projector via the DHD Controller. This control includes all image quality adjustments as well as Projector adjustments such as image configuration.
- Maximum lamp life of approximately 2000 hours.
- An adaptive two-dimensional comb filter that greatly reduces artifacts when using Composite video.
- Inverse telecine (3:2 pulldown) detection and processing allows the scaler to completely eliminate interlace artifacts associated with other scalers. 2:2 pulldown for making the correct TV signals
- A Time Base corrector circuit is provided for unstable sources such as VCRs.
- Three 12v outputs for drop down screens and screen masking.
- Automatic switching between NTSC and PAL signals.
- Fully RS-232 controllable, with direct access to sources and aspect ratios.
- A simple remote controls all aspects of operation, and includes discreet on/off, aspect ratio and source selection commands.
- Two Input terminals for DVI sources (Digital) on the DHD Controller.

Projector Description

Top View



Focus Ring: Turn this ring to focus the image.

Zoom Tab: Turn this tab to make the image larger or smaller.

Vertical Lens Shift: Using the provided adjustment tool, turn this to move the lens up and down.

Power: Led is red when unit is in standby, blue when it is in operation.

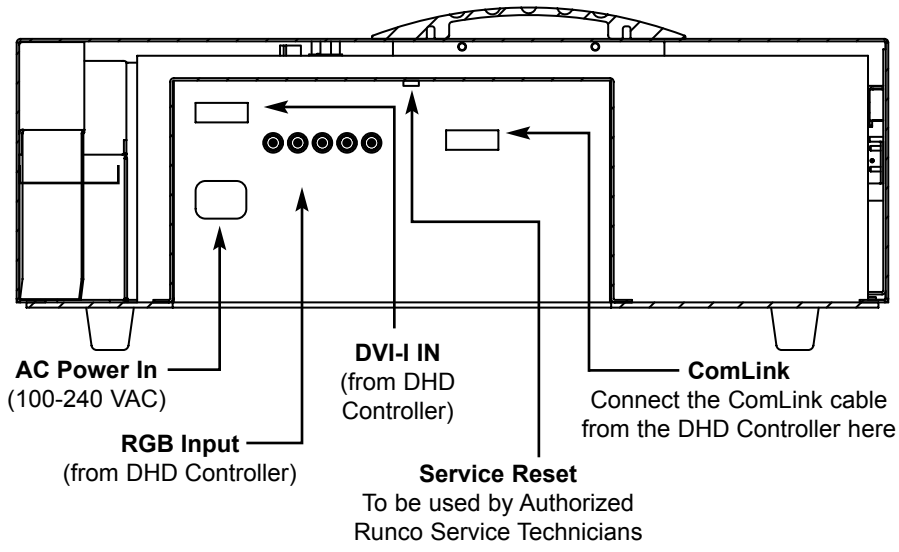
Lamp: When the lamp is on, this LED is blue. When the lamp is off, this LED is off.

Temp: If the Projector has overheated and shut down, this will light red.

Intake Vents: This is where cooler air enters the Projector. Ensure that it is never blocked or overheating will result.

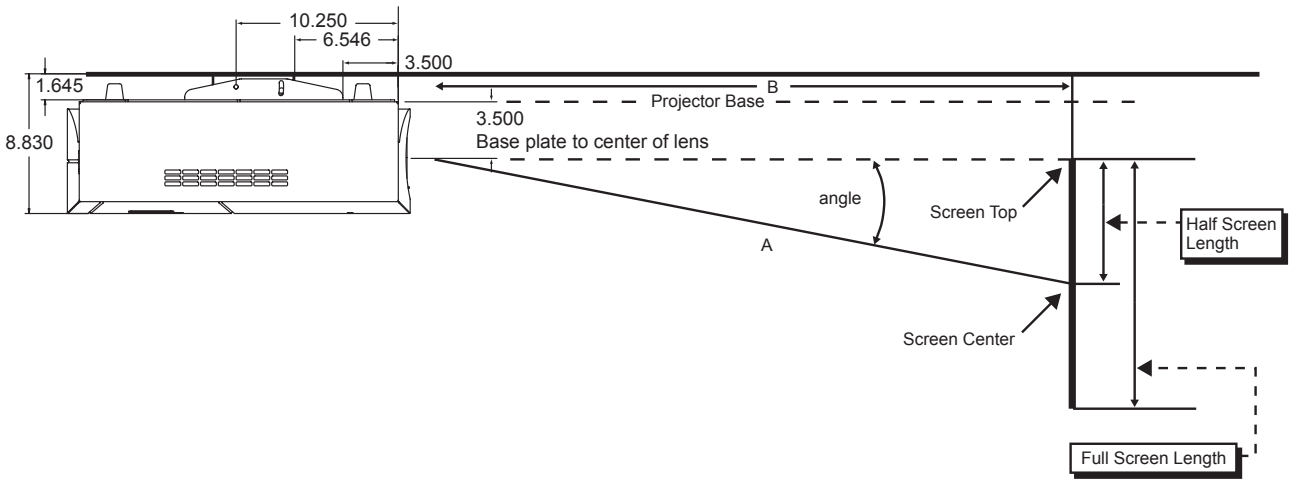
Exhaust Vents: This is where hot air exits the Projector. This air can be quite hot. Ensure that there are no heat-sensitive objects near it and that it is never blocked.

Input Panel



Projector Placement and Offset Information

Ceiling Mount Configuration



SCREEN _____ (H) x _____ (W)

B) THROW DISTANCE FOR 16 x 9 SCREENS:

Minimum: = (screen width x 1.85) = _____ inches

Maximum: = (screen width x 2.4) = _____ inches

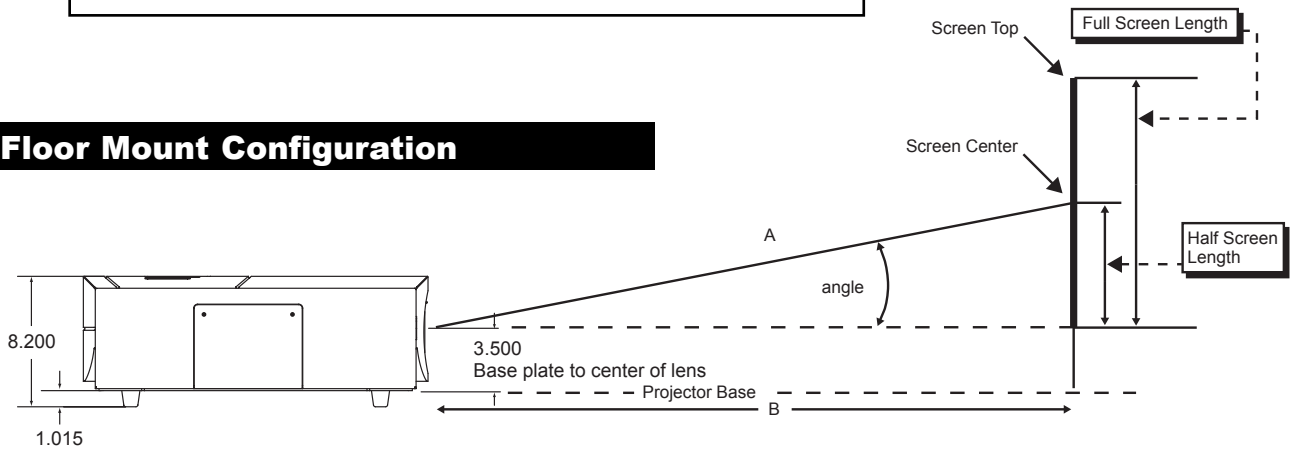
C) VERTICAL OFFSET:

Distance between lens center and top edge of viewing area

(bottom edge for floor mount): Between 0 and (0 - screen height)

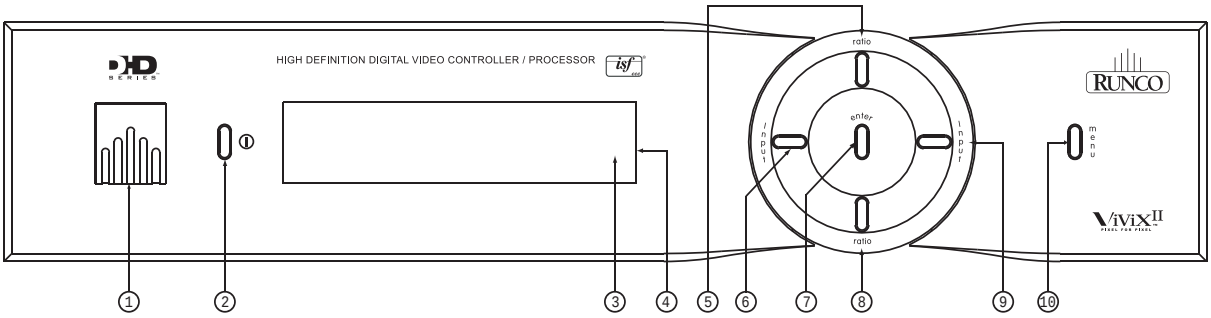
NOTE: These figures are the same for both ceiling and floor configurations.

Floor Mount Configuration



DHD Controller Description

Front Panel



1. RUNCO ICON

When the Red light is displayed the unit is in Standby, when Blue light is displayed the unit is On.

2. POWER BUTTON

Press once to toggle on from Standby mode to On mode, a second time to place into Standby mode.
For a discreet on or off command, you can use the direct access buttons on the remote control.

3. IR RECEIVER

Receives the IR commands from the remote.

4. VACUUM FLORESCENT DISPLAY

Reads out all relevant status information of the DHD at all times. Can be used instead of the On Screen Display. Indicates the model number, current source, scan rate (resolution) and aspect ratio.

5. UP BUTTON

Use to direct select aspect ratios or move the menu cursor Up in the On-Screen Display. When no menus are present on-screen, the UP button will toggle you through aspect ratios in the following order:

Anamorphic → Standard (4:3) → Letterbox → VirtualWide

6. LEFT BUTTON

Used to direct select inputs or move the menu cursor Left in the On Screen Display. When no menu is present on-screen, the LEFT button will toggle you through the different sources, in the order of:

HD Pass Thru 2 → HD Pass Thru 1 → DVI 2 → DVI 1 → HD/RGB2 → HD/RGB1 → Component SD → S-Video 2 → S-Video 1 → Composite

7. ENTER BUTTON

When an item is highlighted on the On-Screen Display, the ENTER button will select the item.

8. DOWN BUTTON

Use to direct select aspect ratios or move the menu cursor Down in the On-Screen Display. When no menu is present on-screen, this button will toggle you through the different aspect ratios.

VirtualWide → Letterbox → Standard (4:3) → Anamorphic

9. RIGHT BUTTON

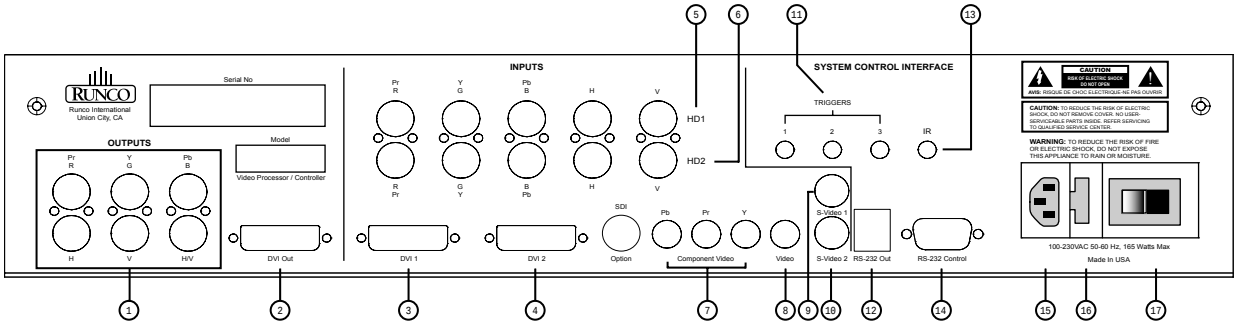
Used to direct select inputs or move the menu cursor Right in the On Screen Display.When no menus are present on-screen, the RIGHT button will toggle you through the different sources, in the order of:

Composite → S-Video 1 → S-Video 2 → Component SD → HD/RGB 1 → HD/RGB 2 → DVI 1 → DVI 2 → HD Pass Thru 1 → HD Pass Thru 2

10. MENU BUTTON

Pressing the MENU button will bring up the main menu. Also, if you are in an adjustment mode or function, pressing MENU will bring the menu back one level.

Rear Panel



OUTPUTS:

1. **ANALOG OUTPUTS (BNC Connectors)**
   The various output lines used to drive the analog input of the display device. Individually, the jacks are: V=vertical sync, H=horizontal sync, B=Blue, G=Green, R=Red. Connect these to the corresponding projector inputs.
   NOTE: If DVI input is used with HDCP content, RGBHV output is automatically disabled. This is in compliance with HDCP regulations. To switch to DVI output see 'Projector Configuration' on page 15.

2. **DVI OUT**
   The DVI digital link used to drive the digital input of an HDCP compliant display device. Connect to the projector's DVI inputs.

INPUTS:

3. **DVI 1 (Digital)**
   DVI input #1, HDCP compliant.

4. **DVI 2 (Digital)**
   DVI input #2, HDCP compliant.

5. **HD 1 (Analog BNC connectors)**
   High Definition input #1, can be RGB(HV) or YPrPb, 480i, 480P, 720P or 1080i.

6. **HD 2 (Analog BNC connectors)**
   High Definition input #1, can be RGB(HV) or YPrPb, 480i, 480P, 720P or 1080i.

7. **COMPONENT INPUT (RCA connectors)**
   Standard Definition (480i/576i) Component (YPrPb) input. This is the input for component video from sources such as DVD players. *(For best results do not run DVD player in progressive mode).*

8. **COMPOSITE INPUT (RCA connector)**
   This is the input for Composite Video input from sources such as Laser disc players, VCRs and other miscellaneous video sources.

9. **S-VIDEO 1 INPUT**
   This is the input for S-video #1 from sources such as Satellite receivers, S-VHS VCR's and DVD players.

10. **S-VIDEO 2 INPUT**
    This is the input for S-video #2 from sources such as Satellite receivers, S-VHS VCR's and DVD players.

11. **TRIGGERS 1/2/3 (Outputs)**
    Connection for 3 different 12V trigger controlled devices.

12. **RS-232 OUT (RJ-11 Connector)**
    Comlink connection to VX-1000d projector.

13. **IR**
    Wired input from an external remote control.

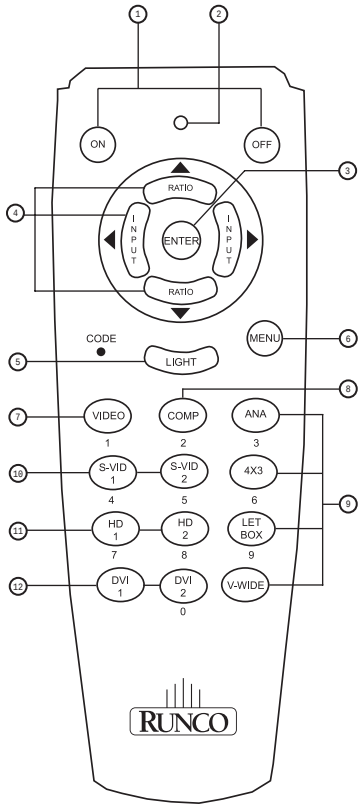
14. **RS-232 CONTROL**
    Connection for an external RS-232 controller device to place the DHD under system automation control.

15. **POWER INPUT (100-230v)**
    Plug in main power here.

16. **MAINS FUSE**
    This is the main AC input fuse. (Main Fuse: 5mm x 20mm, 500mA, 250V, Slow Blow)

17. **MAIN POWER SWITCH**
    Disconnects or applies main power to the processor.

Remote Control Description



(1) ON/OFF

Switches Power ON/OFF. (This does not operate when POWER/STANDBY indicator of the main unit is off.)

(2) IR OUTPUT INDICATOR

Illuminates when a button in pressed, indicating that an IR signal is being transmitted.

(3) ENTER BUTTON

When an item is highlighted on a menu, pressing ENTER will select that item.

(4) CURSOR (▲ / ▼ / ◀ / ▶)

Use these buttons to select items or settings and to adjust settings or switch the display patterns.

UP Button: When no menus are present on-screen, the UP button will toggle through aspect ratios in the following order: (RATIO)

Anamorphic ⟶ Standard (4:3) ⟶ Letterbox ⟶ VirtualWide

LEFT Button: When no menus are present on-screen, the LEFT button will toggle through the different sources in the following order: (INPUT)

HD Pass Thru 2 ⟶ HD Pass Thru1 ⟶ DVI 2 ⟶ DVI 1 ⟶ HD/RGB2 ⟶ HD/RGB 1 ⟶ Component SD ⟶ S-Video 2 ⟶ S-Video 1 ⟶ Composite

DOWN Button: When no menus are present on-screen, the RIGHT button will toggle through the different sources in the following order: (RATIO)

VirtualWide ⟶ Letterbox ⟶ Standard (4:3) ⟶ Anamorphic

RIGHT Button: When no menus are present on-screen, the RIGHT button will toggle through the different sources in the following order: (INPUT)

Composite ⟶ S-Video 1 ⟶ S-Video 2 ⟶ Component SD ⟶ HD/RGB 1 ⟶ HD/RGB 2 ⟶ DVI 1 ⟶ DVI 2 ⟶ HD Pass Thru 1 ⟶ HD Pass Thru 2

(5) LIGHT BUTTON

Press this to illuminate the buttons.

(6) MENU BUTTON

Pressing this button will access the OSD controls. Press this button during the display of the sub-menu to return to the previous menu.

(7) VIDEO BUTTON

Press this button to select VIDEO (composite video) as the source.

(8) COMP BUTTON

Press this button to select Component SD (480i/576i) input.

(9) DIRECT ACCESS BUTTONS

These red buttons to the right hand-side will allow you direct access to an aspect ratio, or selection of a number in certain cases. These buttons are:

ANA - selects Anamorphic aspect ratio
4x3 - selects Standard 4:3 aspect ratio
LETBOX - selects Letterbox aspect ratio
V-WIDE - selects VirtualWide aspect ratio

(10) S-VID 1 and S-VID 2 BUTTONS

Press this button to select between S-Video 1 and S-Video 2 inputs.

(11) HD1 and HD2 BUTTONS

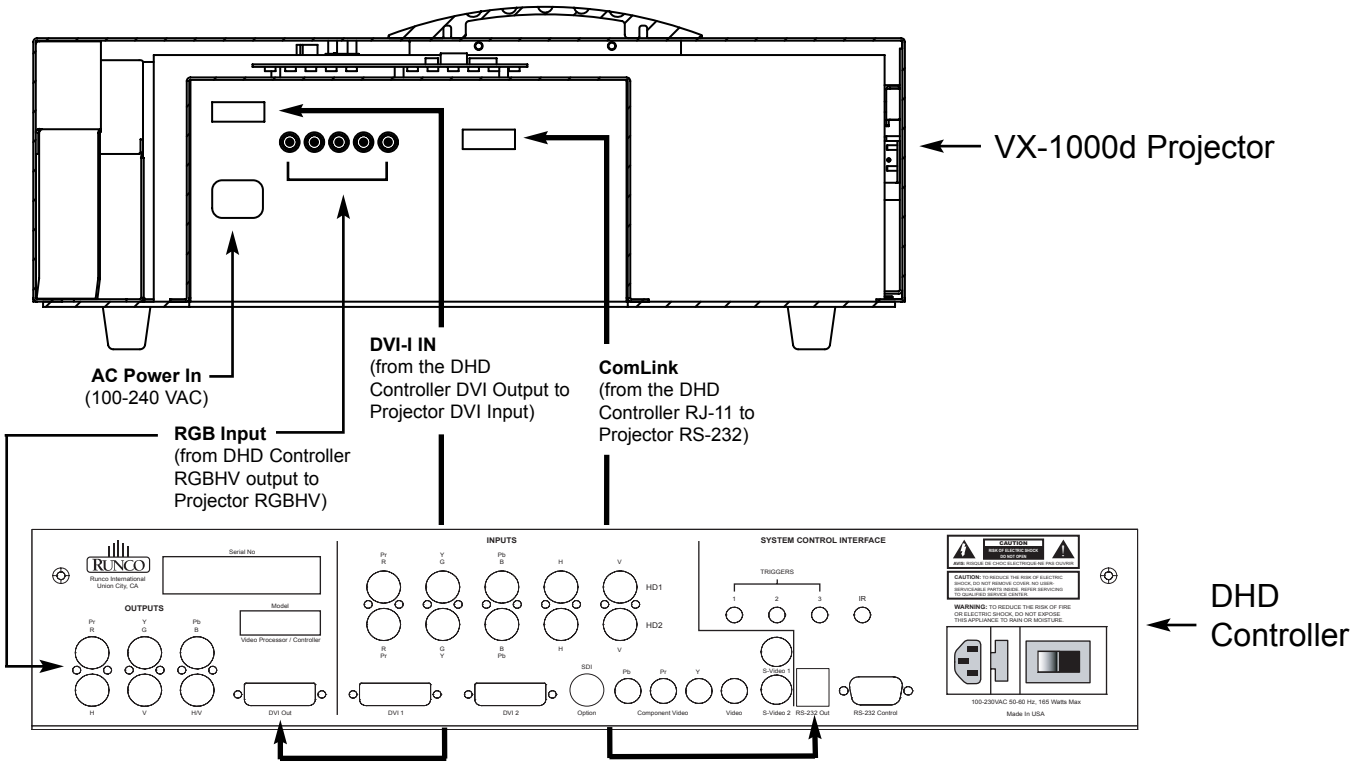
Press this button to select between HD1 (High Definition) signal and HD2 signal inputs. Auto detect component input, YPbPr or RGBHV.

(12) DVI 1 and DVI 2 BUTTONS

Press this button to select between DVI1 signal and DVI2 signal input.

Quick Set-up Guide

Connection Examples



While there are many different ways to connect your source equipment to your **DHD Controller**, the examples shown above are the most common.

ANALOG INPUTS:

• Composite Video Input

Composite video is the most common type of signal used, but is also the lowest in picture quality. Many sources have outputs that are limited to composite video, such as some VCR's and camcorders; others such as Laser Disc players actually produce slightly better results when using composite video.

• S-Video Input

S-video is the second-best type of signal that can be used, but is MUCH better than composite video. Using such sources as Satellite receivers, high-quality VCRs and DVD players (with no component output) will produce a MUCH cleaner and sharper signal.

• Component Input

Component video is the best type of signal that can be used. The most common sources that use component outputs are DVD players, and it is highly recommended that component be used when possible. Component video goes one step beyond S-video in picture quality; chroma (color) information is more resolved and the overall picture appears more well-defined. *(be sure to shut off progressive scan on your DVD player)*

• HD1 / HD2

These are High Definition Analog inputs to connect the outputs of high definition sources such as HD tuners and set top boxes, HD satellite receivers, etc. These inputs will accept signals as RGB, RGBHV or Component Video (YPrPb).

DIGITAL INPUTS:

• DVI 1 / DVI 2
These are High Definition Digital inputs. Runco recommends using these digital inputs whenever possible. Using the DVI 1 and DVI 2 inputs ensures the highest video quality because the signal is carried in the digital domain throughout the entire signal path, from source component output, through the DHD and finally into the projector. This maintains maximum signal purity.

Use these inputs to connect Digital High Definition sources that have a DVI output, such as HD tuners and set top boxes, satellite receivers, DVD players, etc.

PROJECTOR CONFIGURATION

Now that your DHD Controller has been installed, it's time to get it configured for use in your system. The VX-1000d/DHD is defaulted for RGBHV interface between the DHD controller and the VX-1000d projector. Superior picture quality will be obtained if you connect the two units together with a DVI cable. Please follow the procedures and recommendations below:

Changing from RGBHV to DVI output: Connect the controller and projector with RGBHV and follow the steps listed below on the projected OSD (on-screen display) or use the procedure using the florescent display on the controller.

1. First, connect all sources (DVD, VCR, Satellite receiver, etc.) to the DHD, if this has not already been done. Also, ensure all sources are ON and functioning, if possible.
2. Connect the phone line (RJ-11) between Projector and controller.
3. Press MENU and ENTER at the same time, this enables service mode.
4. Press Up Arrow once, display should read SERVICE.
5. Press ENTER.
6. Press Down Arrow four times, display should say DISPLAY DEVICE.
7. Press ENTER.
8. Display should now say CONFIGURE.
9. Press ENTER.
10. Use Left or Right Arrow to select Input 2 for DVI input.
11. Press ENTER. Projector should now be set for DVI input.

ISF Calibration

The VX-1000d/DHD system has been designed to incorporate setup and calibration standards established by the Imaging Science Foundation (ISF). The ISF has developed carefully crafted, industry-recognized standards for optimal video performance and has implemented a training program for technicians and installers to use these standards to obtain optimal picture quality from Runco video display devices. Accordingly, Runco recommends that setup and calibration be performed by an ISF certified installation technician.

All signal types require separate processing. Therefore there is a need to calibrate each and every input separately.

When beginning calibration of the DHD, it is imperative that at least one of the analog SD inputs (S-Video or RCA Component) be calibrated first. In doing this, the projector is calibrated to the controller. After one of the SD inputs is calibrated, calibration of the HD analog or DVI sections can follow.

Once the initial settings have been completed, the "front panel display" (color, tint, sharpness, etc.) can be adjusted for each aspect ratio. The calibration procedures for these adjustments are outlined in "picture quality adjustments".

Overall Functional Description

The **VX-1000d system** consists of the **VX-1000d Projector and DHD Controller**. This system is unique in the way it is controlled; the control center for this system is located within the DHD Controller. The DHD Controller tells the Projector to turn on or off, controls its brightness, contrast, color temperature and more. All of this is accomplished by Runco's unique ComLink, which is the transfer of information between the DHD Controller and the Projector via their ComLink ports on a CAT5 cable (or similar) with RJ-11 ends. Therefore, only the DHD Controller's remote control is necessary to control all aspects of this system.

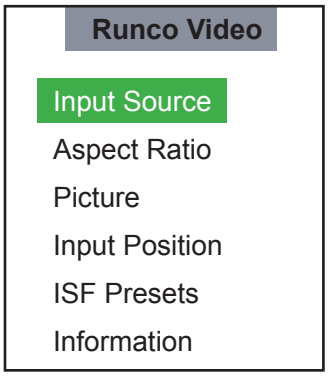
Besides being the system's control center, the DHD Controller is also a high-quality scaler, which outputs all signals in the native resolution of the VX-1000d Projector. The Composite, S-Video and Component (non-progressive) signals are sent through the DHD Controller's 10-bit decoder, de-interlaced, then scaled to the native resolution of the Projector. In the case of HDTV or progressive DVD signals, these are input to the RGB/Component port. However, we strongly recommend that progressive scan DVD players be set to the “Interlaced” mode. This will allow the DHD’s superior de-interlacing to convert the signal to progressive scan for optimal picture quality.

In the next chapter, the menu system will be described in detail. There are many adjustments available to perfect the VX-1000d's image, including typical 'front-panel controls' as well as color temperature and other image-quality controls.

Menu Description and Navigation

Main Menu

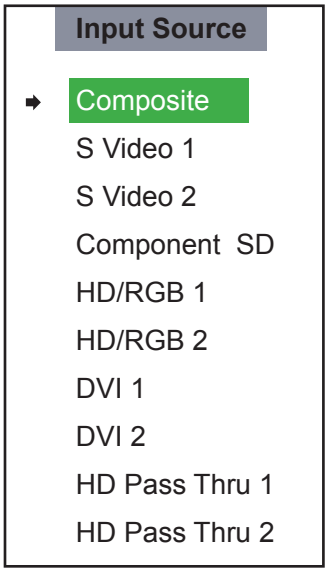
When the MENU button is pressed on either the remote control or the front panel, the main menu will appear on-screen. An example of the main menu is shown above.



Opening Screen

- Press ENTER to access the Input Source selection menu
- Press ENTER to access the Aspect Ratio selection menu
- Press ENTER to access the Picture setting menu
- Press ENTER to access the Input Position setting menu
- Press ENTER to access the ISF and Custom Presets menu
- Press ENTER to receive information about the controller

The active source is indicated by an arrow to the left of the source; note that in the example to the right, Composite is the current source.



Input Source

Indicates selection has been made for the Input Source selection menu

- Press ENTER to select the Composite input
- Press ENTER to select the S-Video input
- Press ENTER to select the Picture setting menu
- Press ENTER to select the Input Position setting menu
- Press ENTER to select the ISF and Custom Presets menu
- Press ENTER to receive information about the controller

To select a source via the main menu, press either the up or down buttons on the remote or front panel and highlight the desired source, and press ENTER. Otherwise, you may select a source by pressing either the left or right arrow buttons (on the remote or front panel) when no menus are on-screen, or by pressing one of the direct access buttons on the remote control (recommended).

NOTE: If DVI input is used with HDCP content, RGBHV output is automatically disabled. This is in compliance with HDCP regulations.

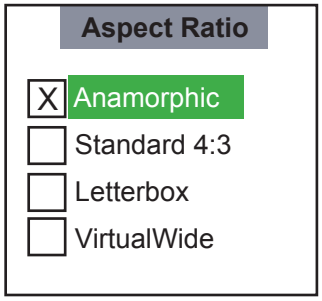
If pass-through is selected, note that no on-screen menus will be displayed since the signal is simply being 'looped' directly to the output. When pass-through is the selected source, pressing MENU will not automatically select the last selected input before Pass-through was selected. If you wish to choose another source, Runco recommends using the direct access buttons to select the desired source as opposed to pressing MENU.

Aspect Ratio provides selection of one of four aspect ratios: Anamorphic, Standard 4:3, Letterbox or VirtualWide. To select an aspect ratio via the main menu, press either the up and down buttons on the remote or front panel, highlight ASPECT RATIO and press ENTER. The aspect ratio menu will then appear with the four choices; highlight the desired aspect ratio with the up or down buttons and press ENTER. Otherwise, you may select an aspect ratio by pressing either the up or down arrow buttons (on the remote or front panel) when no menus are on-screen, or by pressing one of the direct access buttons on the remote control.

Aspect Ratio

Indicates selection has been made for the Aspect Ratio selection menu

- Press ENTER to select the Anamorphic Aspect Ratio
- Press ENTER to select the Standard 4:3 Aspect Ratio
- Press ENTER to select the Letterbox Aspect Ratio
- Press ENTER to select the VirtualWide Aspect Ratio



Picture quality adjustments are the controls that change different parameters of the image such as the amount of color, black level, etc. While these adjustments can be set to suit the needs of the user, there is a way to set these properly. This section will describe what each function does and how to adjust them properly.

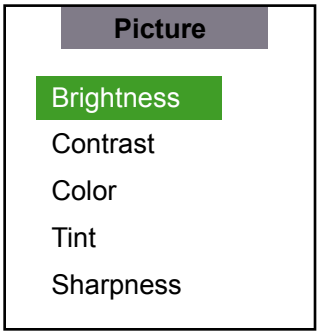
To access the picture quality adjustments, press MENU and over the cursor down to Picture (indicated by the green highlight) and press ENTER. The picture quality sub-menu will then appear.

To make an adjustment to a particular function, highlight the function with the up or down arrow buttons and press ENTER. Once the function is on-screen (i.e. brightness), pressing the UP arrow button on the remote or front panel will increase the value of that function; pressing the DOWN arrow on the remote or front panel will decrease the value of that function.

Picture

Indicates selection has been made for the Picture selection menu

- Press ENTER to allow the increase and decrease of image Brightness with the LEFT and RIGHT arrows.
- Press ENTER to allow the increase and decrease of image Contrast with the LEFT and RIGHT arrows.
- Press ENTER to allow the increase and decrease of image Color with the LEFT and RIGHT arrows.
- Press ENTER to allow the increase and decrease of image Tint with the LEFT and RIGHT arrows.
- Press ENTER to allow the increase and decrease of image Sharpness with the LEFT and RIGHT arrows.

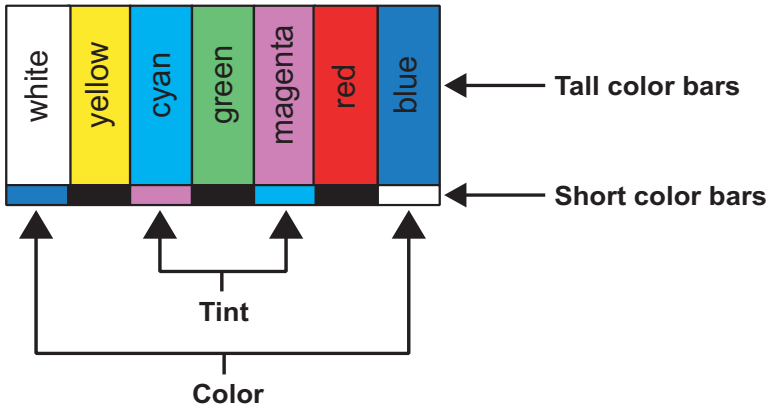


NOTE: A BLUE FILTER must be used so only the blue color bars can be seen on a standard color bar test pattern. Blue filters are provided with the Video Essentials or AVIA test DVDs.

While each of the picture quality adjustments can be set to suit the needs of the user, there is a 'proper' way to set the adjustments. For setting TINT and COLOR, please refer to the color bar test pattern below.

TINT (also known as 'hue') is essentially the ratio of red to green in the color portion of the image. If TINT is decreased, the image will appear redder, and increasing it will cause the image to appear greener. To set TINT properly, look at the color bar pattern through a blue filter (or mute the red and green outputs). Adjust TINT until the middle two tall color bars match the middle short color bars (see color bar drawing).

COLOR (also known as 'saturation') increases or decreases the amount of color in the image. To set COLOR properly, look at the color bar pattern through a blue filter (or mute the red and green outputs). Adjust COLOR until the outer two tall color bars match the outer short color bars (see color bar drawing).



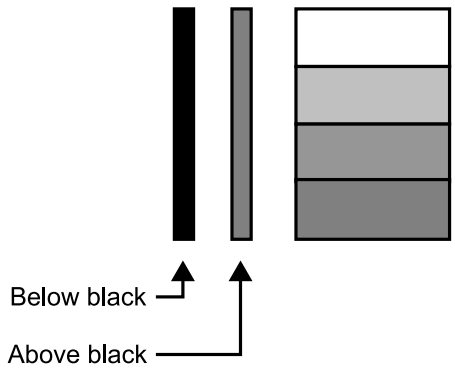
BRIGHTNESS adjusts the black level of the image. To adjust this properly, adjust BRIGHTNESS until the 'below black' bar JUST disappears, but the 'above black' bar is still barely visible.

NOTE: Some DVD players cannot pass the 'blacker than black' bar (they won't pass PLUGE), and that bar will never be visible. In a case like this, adjust the 'above black' bar until it is slightly brighter than the background that surrounds it.

CONTRAST adjusts the white level of the image. For Fixed-pixel displays, adjust contrast until there is a distinct definition between the two brightest bars.

NOTE: For best results, Runco recommends that CONTRAST be set to '0' or very close to it. (see below)

For setting ***BRIGHTNESS***
use the pluge pattern:



For setting ***CONTRAST***
use the 10 step gray scale:

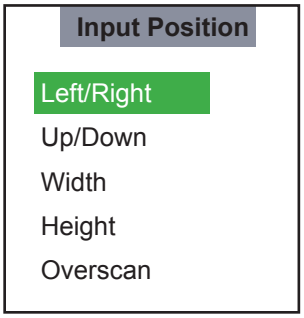
SHARPNESS adjusts the amount of high-frequency detail in the image. This can be adjusted to the preference of the user. Keep in mind that when SHARPNESS is decreased, fine details in the image will become 'soft'; when it is increased, fine details will become sharper but will also make the picture appear 'noisy' if adjusted too high.

All the picture adjustments (contrast, brightness, color, tint and sharpness) must be saved manually to Custom 1 or Custom 2 under ISF presets menu. If not, all the picture adjustments will be whited out when ISF presets (ISF Night, ISF Day, Custom 1, Custom 2) are changed.

Input Position

Indicates selection has been made for the Input Position selection menu

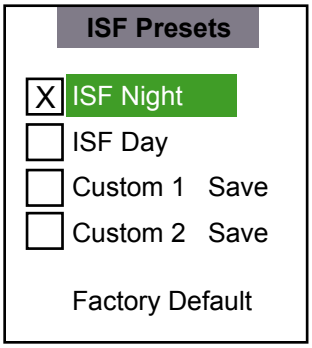
- Press ENTER to allow shifting the Image Position Left/Right with the LEFT and RIGHT arrows.
- Press ENTER to allow shifting the Image Position Up/Down with the LEFT and RIGHT arrows.
- Press ENTER to allow shifting the Image Position Width with the LEFT and RIGHT arrows.
- Press ENTER to allow shifting the Image Position Height with the LEFT and RIGHT arrows.
- Press ENTER to allow shifting the Image Position Overscan percentage with the LEFT and RIGHT arrows.



ISF Presets

Indicates selection has been made for the ISF Presets selection menu.

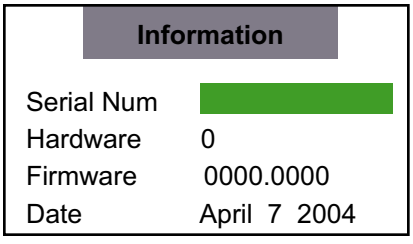
- Press ENTER to select the ISF Night calibration settings.
- Press ENTER to select the ISF Day calibration settings.
- Press ENTER to select the Custom 1 calibration settings, or scroll RIGHT and press ENTER to save settings you have made.
- Press ENTER to select the Custom 2 calibration settings, or scroll RIGHT and press ENTER to save settings you have made.
- Press ENTER to force the Presets back to their Factory Default settings.



Information

Indicates selection has been made for the Information selection menu

- Indicates the unit Serial Number on the front panel display.
- Indicates the Hardware Version number on the front panel display.
- Indicates the Firmware Version number on the front panel display.
- Indicates the Firmware Version build date on the front panel display.



Basic Troubleshooting Tips

The following is a basic troubleshooting guide that can assist you in resolving typical problems may result in normal operation. If you have encountered problems that are not listed in this guide, please contact your Runco dealer for assistance.

PROBLEM	POSSIBLE CAUSE	SOLUTION
The Projector does not turn on after initial installation. The Power LED on the front of the Controller stays red after the power button is pressed.	· The RJ-11 (ComLink) cable is not connected between the Controller and Projector, or is connected improperly. · The projector is not plugged in, or its AC outlet is not active. Look at its power LED and see if it is illuminated. · Incorrect phone cord	· Use a standard RJ-11 phone-type cord. Ensure it is firmly plugged into both the Controller and the Projector. · Ensure there is good continuity in the RJ-11 cable. · Verify that the AC outlet is active, or that the Projector is plugged in.
The Projector and Controller are both on, but there is no video image on-screen.	· The Controller is on the wrong source. · The Controller is on the correct source, but the source itself is off.	· Press MENU on the Projector's remote, and look to see which source is active (the arrow will be pointing to the active source). Select the correct source as appropriate. · Turn on the source. It is recommended that all sources be turned on first BEFORE the VX-1000d.
The Projector is producing a 'split screen' or an otherwise scrambled image.	· A progressive scan DVD is plugged into Component input rather than the RGB/Component input.	· Only NTSC/PAL can be input to the Component input. Progressive scan must go into RGB/Component.
The image appears too bright, and there is a loss of definition in the brightest areas of the image.	· Contrast is set too high. · The DVD player is set for a high-level output. · The video signal has not been terminated properly somewhere in the system.	· Turn down the CONTRAST level on the Controller. Mid-range is 0; · Set the DVD player for a nominal output (no boost or gain). · Ensure all video signals are terminated in 75 Ohms.

The image appears too 'washed out', or the darkest areas of the image appear too bright.	· Brightness is set too high. · The DVD player may be set for too high of a brightness level.	· Turn down the BRIGHTNESS level on the Controller. If possible, use a PLUGE pattern to set the brightness level properly. · Set the DVD player for a nominal output (no boost or gain).
The colors of the image appear abnormal	· The Red, Green and/or Blue outputs of the Controller or inputs to the Projector are reversed. · The Pr and Pb inputs on the Component input on the Controller are reversed	· Check the cable connections on the back of the Controller or on the Projector.
The Projector will not turn back on after it was powered-down, or the image disappears during operation.	· The Projector will not turn on for two minutes after power-down to protect its bulb. · The bulb has failed	· Wait two minutes until the LED on the front of the Controller turns red.

RS-232 Communications

General Information

Baud rate: 19200 (fixed)
Bits: 8
No Parity

All protocol in ASCII format

RS-232 input connector pin numbers: TxD= Pin# 2, RxD= Pin# 3, GnD= Pin# 5

Command format (single command): command value (i.e. brightness 100).
NOTE: A space (not an underscore) or comma may be used between the command and its value.

Command string format: command,command value, command etc.
(i.e. COMPOSITE,BRIGHTNESS 100,ANAMORPHIC,<CR>)

NOTE: In between commands, a comma or space may be used

NOTE: A carriage return must be used after each command or string.

Other notes:

- For command strings, a maximum of 255 characters can be used in a single string.
- PARAMETER min/max refers to a function's minimum and maximum value range. Inputting values above or below their range may cause unpredictable (but not fatal) results.

RS-232 Commands

COMMAND	PARAMETER (min/max)	Value stored?	DESCRIPTION
POWER	0/1	NA	Turns DHD On and Off
ON	NA	NA	Turns DHD Controller on
OFF	NA	NA	Turns DHD Controller off
COMPOSITE	NA	YES	Selects the Composite video input
SVIDEO1	NA	YES	Selects the S-Video 1 input
SVIDEO2	NA	YES	Selects the S-Video 2 input
COMPONENT	NA	YES	Selects the Component input
HD1	NA	YES	Selects the RGB HD 1 input
HD2	NA	YES	Selects the RGB HD 2 input
DVI1	NA	YES	Selects the DVI 1 input
DVI2	NA	YES	Selects the DVI 2 input
HD1Pass	NA	YES	Selects the HD 1 Pass Thru input
HD2Pass	NA	YES	Selects the HD 2 Pass Thru input
ANAMORPHIC	NA	YES	Selects the anamorphic aspect ratio
STANDARD	NA	YES	Selects the standard (4:3) aspect ratio
LETTERBOX	NA	YES	Selects the letterbox aspect ratio
VIRTUALWIDE	NA	YES	Selects the VirtualWide aspect ratio
RGBNN	NA	YES	Outputs color space RGB w/negative, negative sync
RGBPP	NA	YES	Outputs color space RGB w/positive, positive sync
RGBS	NA	YES	Outputs color space RGB w/embedded sync on green
YUV	NA	YES	HD YUV output color space
IHPOS	-100/100	YES	Sets a value for horizontal position input
IVPOS	-100/100	YES	Sets a value for vertical position input
IWIDTH	-100/100	YES	Sets the value for width input
IHEIGHT	-100/100	YES	Sets the value for height input
OVERSCAN	0/10	YES	Sets the overscan value in %
OHPOS	-100/100	YES	Sets the value for width output
OVPOS	-100/100	YES	Sets the value for height output
OWIDTH	-100/100	YES	Sets the value for width output
OHEIGHT	-100/100	YES	Sets the value for height output

COMMAND	PARAMETER (min/max)	Value stored?	DESCRIPTION
BRIGHTNESS	-100/100	YES	Sets a value for brightness
CONTRAST	-100/100	YES	Sets a value for contrast
COLOR	-100/100	YES	Sets a value for color
TINT	-100/100	YES	Sets a value for tint
SHARPNESS	-6/6	YES	Sets a value for sharpness
NIGHT	NA	YES	Selects the ISF Night setting
DAY	NA	YES	Selects the ISF Day setting
CUSTOM1	NA	YES	Sets the value per client
CUSTOM2	NA	YES	Sets the value per client
TRIGGER	1/3	YES	Sets the trigger
BKGND	-100/-100	YES	Sets the background color for letterbox
IHPOS?	NA	NA	Returns input horizontal position value
IHEIGHT?	NA	NA	Returns input vertical height value
OHPOS?	NA	NA	Returns output horizontal position value
OHEIGHT?	NA	NA	Returns output vertical height value
COLOR?	NA	NA	Returns color setting value
ASPECT?	NA	NA	Returns current aspect ratio
INPUT?	NA	NA	Returns active input
OUTRES?	NA	NA	Returns output resolution
SERIALNUM?	NA	NA	Returns serial number
DATE?	NA	NA	Returns the date of mfg
IVPOS?	NA	NA	Returns input vertical position value
OVERSCAN?	NA	NA	Returns overscan percentage
OVPOS?	NA	NA	Returns output vertical position value
BRIGHTNESS?	NA	NA	Returns brightness setting value
TINT?	NA	NA	Returns tint setting value
PRESET?	NA	NA	Returns preset ISF day or night
POWER?	NA	NA	Returns power status
ASPECTIN?	NA	NA	Returns the input source aspect
SWVER?	NA	NA	Returns software version number
IWIDTH?	NA	NA	Returns input horizontal width value
PHASE?	NA	NA	Returns phase setting value
OWIDTH?	NA	NA	Returns output horizontal width value
CONTRAST?	NA	NA	Returns contrast setting value
SHARPNESS?	NA	NA	Returns sharpness setting value
BKGND?	NA	NA	Returns background setting value
INRES?	NA	NA	Returns input resolution
ASPECTOUT?	NA	NA	Returns output screen size
HWVER?	NA	NA	Returns hardware version number

Specifications

VX-1000d Projector:

Projector Type:	Digital Light Processing™ (DLP™), Single HD-2+ DMD™ Chip
Native Resolution:	1280 x 720 (Designed for 16:9 screens only)
Aspect Ratios:	Determined by supplied processor
Video Standards:	NTSC, PAL
DTV Compatibility:	480p, 720p, 1080i
Scan Frequency:	Horizontal: 15-81 kHz Vertical: 43-100 Hz
Picture Size: (16:9 screen)	Recommended Width: 72-96 in. Maximum Width: 200 in.
Throw Distance: (Factor x Screen Width)	Minimum: Zoom 1.85 x screen width Maximum: Zoom 2.40 x screen width
Horizontal / Vertical Offset:	Horizontal: 0 / Vertical +/- 50%
Light Output:	CSMS Specifications: Home Theater Calibration: 418-600 ANSI Lumens Foot-Lamberts: 15.6-22.4 1500 ANSI Lumens
Contrast Ratio:	CSMS Contrast Ratio: 211:1 to 229:1 2700:1 to 3300:1
Lamp:	250W NSH
Lamp Life:	2000 hours @ 6500º Kelvin
Inputs:	(1) RGB HV, (1) DVI w/HDCP, (1) RS-232
12V Output:	See Controller for specifications
Power Requirements:	100-240V AC, 50/60 Hz, 375W
Operating Environment:	40°- 95° F, (5°- 35° C), 0%-90% Humidity (non-condensing)
Dimensions: (w/out feet)	Width: 20 7/8 in. (530 mm) Depth: 21 5/8 in. (550.20 mm) Height: 7 1/8 in. (181 mm), with feet 8 1/4 in. (209.50 mm) Weight: 50 lbs. (23 kg) (includes lens)
Regulatory Approvals:	Complies with FCC Class B, CE, C-Tick
Limited Warranty:	**Projector:** (2) Two year parts and labor from the date of delivery to the end user. **Lamp Warranty:** 1000 hours or (6) six months, which ever comes first.

DHD Controller:

Aspect Ratios:	Anamorphic, Letterbox, VirtualWide™, 4:3
Input standards:	NTSC / PAL
Output resolution:	720P
Outputs:	(1) HD - R (Pr), G (Y), B (Pb), H, V; (1) DVI w/HDCP
Inputs:	(1) Composite; (2) S-Video; (1) Component; (2) HD - R (Pr), G (Y), B (Pb), H, V; (2) DVI w/HDCP
Control Options:	Discrete infrared remote, (2) RS-232, (1) 9-pin connector, (1) RJ-11, Front panel controls
Screen Trigger/ Masking Outputs:	(3) 12V DC, 1/8A
Bandwidth:	150 Mega Samples/Second (MSPS)
Power Requirements:	100-240V AC (auto-sensing), 50/60 Hz, 160W
Operating Environments:	41°-95°F (5°-35°C); 0-90% Humidity (non-condensing)
Dimensions:	Width: 17 1/2 in. (444.50 mm) Depth: 11 3/16 in. (284.10 mm) Height: 3 3/4 in. (95.25 mm) Weight: 13 lbs. (5.9 kg)
Regulatory Approvals:	Complies with FCC, CE, C-Tick
Limited Warranty:	(2) Two years parts and labor from the date of delivery to the end user.

Supplied Accessories

- Remote Control with 2 AAA batteries
- Rack Mount hardware
- (1) 6” RGBHV extension for the Controller, (1) 9-pin to RJ-45
- Power cables (one for Projector, one for DHD Controller)
- 50’ RJ-11 phone type cable
- RS-232 to RJ-11 Adapter
- Lens adjustment tool
- User’s Manual
- Warranty information

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